

WHAT IS CLAIMED IS:

1. An optical switch for connecting and/or disconnecting an optical path, comprising:
a housing;
at least one fixed optical fiber having an open end in the housing;
at least one movable optical fiber having an open end capable of moving relatively to the open end of the fixed optical fiber, the open end of the movable optical fiber being located in the housing;

a fulcrum fixing the movable optical fiber at a distance from the open end of the movable optical fiber;

a movable holder of magnetic material holding the movable optical fiber adjacent to the open end of the movable optical fiber and allowing the movable optical fiber to resiliently pivot on the fulcrum to move the open end of the movable optical fiber relatively to the open end of the fixed optical fiber; and

an electromagnetic actuator reciprocating the movable holder, the electromagnetic actuator being located in an area on the movable optical fiber side from the open end of the movable optical fiber in the housing.

2. An optical switch as set forth in claim 1, wherein the electromagnetic actuator comprises:

a first yoke having a first pole piece;

a second yoke having a second pole piece,

the movable holder being placed between the first and second pole pieces so as to reciprocate between the two pole pieces;

a permanent magnet exerting a magnetic flux on the first and second yokes and the movable holder, the permanent magnet constituting a first magnetic path along with the first yoke and the movable holder and constituting a second magnetic path along with the second yoke and the movable holder;

a first coil member wound around the first yoke to adjust the magnetic flux between the movable holder and the first pole piece; and

a second coil member wound around the second yoke to adjust the magnetic flux between the movable holder and the second pole piece.

3. An optical switch as set forth in claim 2, wherein the electromagnetic actuator comprises an E-shaped yoke having two end legs and a center leg, the end legs constituting the first and second yokes, respectively, and the center leg having the permanent magnet.

4. An optical switch as set forth in claim 3, wherein the E-shaped yoke has a back yoke connecting the center leg to both the end legs.

5. An optical switch as set forth in claim 4, wherein the back yoke includes the fulcrum.

6. An optical switch as set forth in claim 2, wherein the electromagnetic actuator further comprises a back yoke magnetically connecting the permanent magnet to both the first and second yokes.

7. An optical switch as set forth in claim 6, wherein the back yoke includes the fulcrum.

8. An optical switch as set forth in claim 4, wherein the first and second coil member extend from the vicinities of the first and second pole pieces, respectively, to the vicinity of the back yoke.

9. An optical switch as set forth in claim 6, wherein the first and second coil member extend from the vicinities of the first and second pole pieces, respectively, to the vicinity of the back yoke.

10. An optical switch as set forth in claim 3, wherein the permanent magnet is located at the end of the center leg to face the movable holder.

11. An optical switch for connecting and/or disconnecting an optical path, comprising:

a housing having at least two end walls facing each other;

at least one fixed optical fiber having an open end adjacent to one of the end walls in the housing;

at least one movable optical fiber having an open end capable of moving relatively to the open end of the fixed optical fiber, the open end of the movable optical fiber being located in the housing;

a fulcrum fixing the movable optical fiber at a distance from the open end of the movable optical fiber and located near the other end wall in the housing;

a movable holder of magnetic material holding the movable optical fiber adjacent to the open end of the movable optical fiber and allowing the movable optical fiber to resiliently pivot on the fulcrum to move the open end of the movable optical fiber relatively to the open end of the fixed optical fiber; and

an electromagnetic actuator reciprocating the movable holder, the electromagnetic actuator being located in an area on the movable optical fiber side from the open end of the movable optical fiber in the housing.